

```
In [2]: import numpy as np
        from numpy import linalg
        from matplotlib import pyplot as plt
```

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In [3]: xdata=np.arange(1960,2020,10)
```

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In [4]: ydata=np.array([179323, 203302, 226542, 249633, 281422, 308746])
```

```
In [18]: Amat=np.array([np.ones(6),xdata]).transpose()
```

```
In [6]: bvec=ydata
```

```
In [7]: Q,R=linalg.qr(Amat)
```

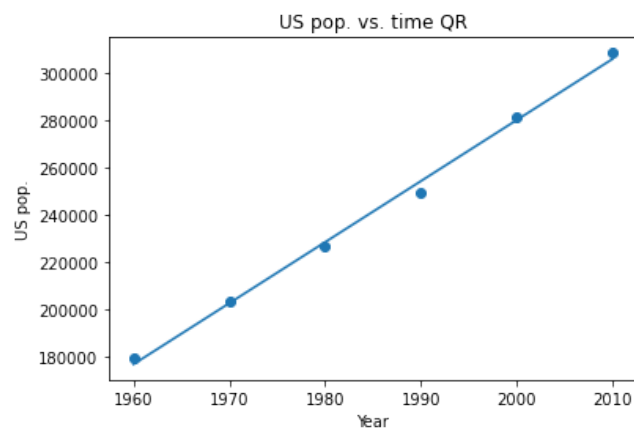
```
In [8]: bqr=Q.transpose().dot(bvec)
```

```
In [9]: xvec=linalg.solve(R,bqr)
```

```
In [10]: xvec
```

```
Out[10]: array([-4.88868679e+06,  2.58447429e+03])
```

```
In [17]: c_0,c_1=xvec
        plt.scatter(xdata,ydata)
        plt.plot(xdata,xdata*c_1+c_0)
        plt.xlabel('Year')
        plt.ylabel('US pop.')
        plt.title('US pop. vs. time QR')
        plt.savefig('US pop vs time QR')
```



```
In [12]: linalg.cond(Amat)
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```
Out[12]: 230733.08869696865
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In [13]: linalg.cond(R)
```

```
Out[13]: 230733.08869696865
```